Land4Climate

A step closer to climate resilience

What is LAND4CLIMATE?

- **LAND4CLIMATE: utilization of private land for mainstreaming nature-based solution in the systemic transformation towards a climate-resilient Europe**
- Duration: **48 Months** (Start date: 1 September 2023 - End date: 31 August 2027)
- EU contribution: **Horizon Europe Framework Programme - Mission: Adaptation to climate change**
- Coordination team: **TECHNISCHE UNIVERSITAT DORTMUND**
- Consortium: **19 organisations from 7 countries**

The objective of LAND4CLIMATE

Getting access to private land for the implementation of NBS, not by buying land, but through the development of **innovative governance schemes and business models**, such as land readjustments schemes, strategic land leases and easements.

LAND4CLIMATE will operationalize this objective in **six frontrunner cases -** in Austria, Czechia, Germany, Italy, Romania and Slovakia – and by involving **seven replicant regions.**

The overall concept of LAND4CLIMATE

There are three reasons for the tardy uptake of NBS in practice which will be addressed by the project:

1. NBS need more land than grey infrastructure
2. approaches to NBS hitherto often focus on public land
3. private land, however, bears huge potential for climate resilience, both as a supplier and a recipient of benefits of NBS

LAND4CLIMATE structure and workflow

- WP1: Evidence-base for climate-resilience
- WP2: Effectiveness & efficiency assessment
- WP3: Barriers & success for NBS
- WP4: Implementation
- WP5: Replication & Upscaling
- WP6: Dissemination & communication
- WP7: Project management

- **Seven Work Packages (WPs) to implement transformative NBS** on private land across six front-runner regions and spin-off to seven replicating regions in the continental biogeographical area.
- The implementation of transformative NBS run through **systematic climate-risk informed planning, proofing suitable NBS, eliminating implementation gaps, realising NBS investments, incubating NBS replication and upscaling**.

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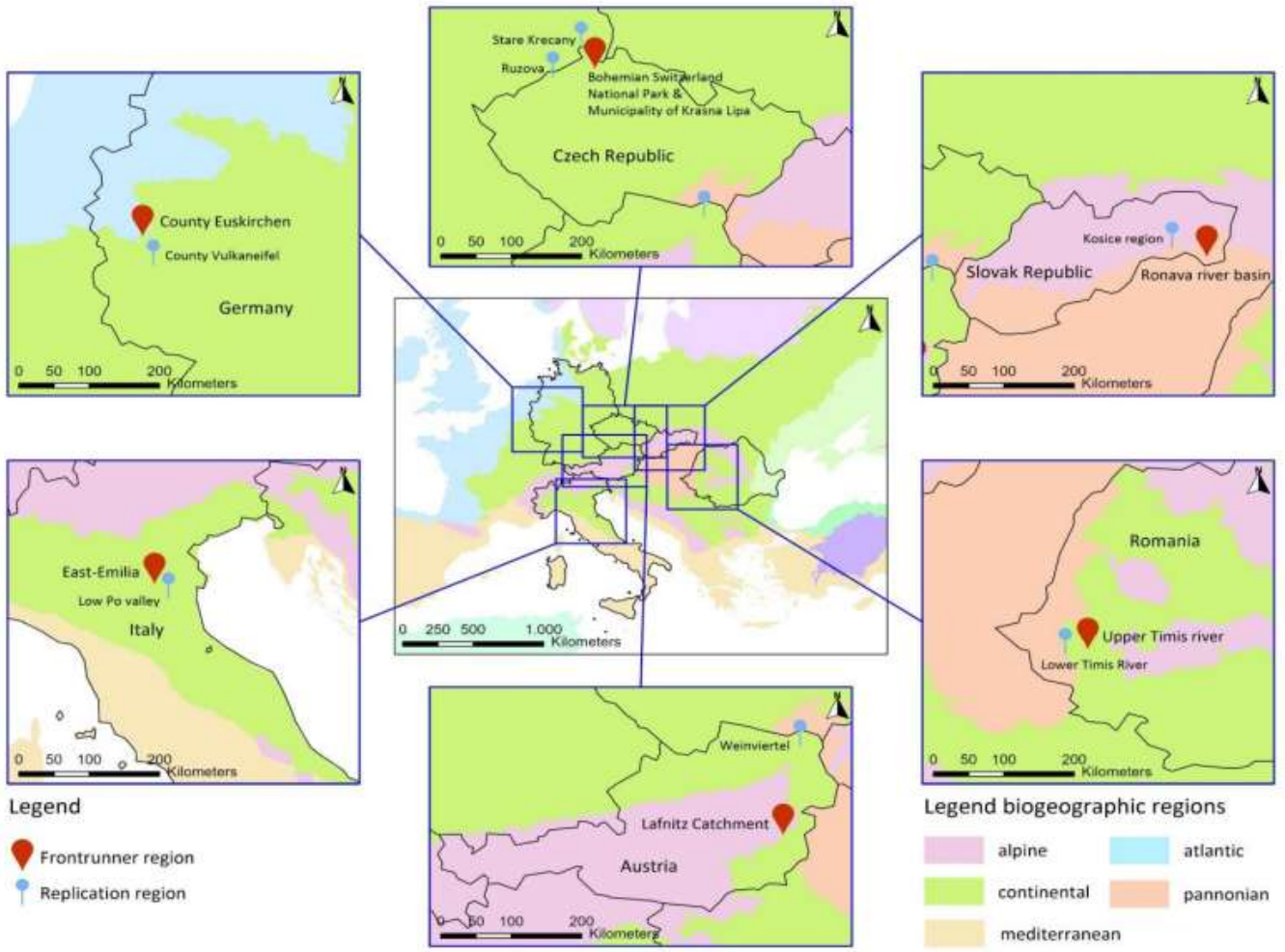
What is the LAND4CLIMATE approach?

- Identifying cause and effect relations of climate risks and NBS to allocate NBS effectively and efficiently
- Developing governance and business models to implement legitimate and just strategies of land policy for NBS on private land
- Enabling successful replication and upscaling



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DE: County of Euskirchen

Climate risks: droughts, urban heat, pluvial floods, river floods, groundwater scarcity

Replicating region: Vulkaneifel

Decentral rainwater management and mproving microclimate in urban areas	• roof top greening • unsealing of areas • decentralized water retention	• increased water retention; • microclimatic improvement • groundwater recharge • soil renaturation • ecosystem improvement
Water retention in agricultural areas	• Water retention basin in collaboration with soil associations	• flood retention • drought prevention • groundwater recharge • ecosystem improvement • microclimatic improvement

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AT: Lafnitz catchment

Climate risks: floods, urban heat, drought, biodiversity loss, groundwater scarcity

Replicating region: Weinviertel

Revitalization of the river-environment system of Lafnitz river	• transformation of land use from agriculture to meadow / riparian softwood / forest; • widening of water course	• reduction of flood risk • creation of habitats • increase biodiversity • increase groundwater level
Reduction of input and runoff of sediments on agricultural land	• cross-slope hedgerow structures with retention capacity • replacing erosion-prone crops for • crops that protect against erosion	• reduction of habitat loss of aquatic biota • reduction of erosion and top soil loss • reduction of irrigation needs
Improve urban water retention	• unsealing of paved land and replace by greenery or infiltration capable surfaces • planting of sponge city trees	• reduction of flood risk • ground water recharge • reduction of urban heat • shading of water body

CZ: National Park Bohemian Switzerland & Krasna Lipa

Climate risks: flash floods, droughts, wildfires, biodiversity loss, groundwater scarcity

Replicating region A: Stare Krecany
Replicating region B: Ruzova

Rivatilazation of floodplain in Krasna Lipa	• restoration of small • water cascades of ponds	• flood retention • drought prevention
Revitalization of river-environment system in Bohemian Switzerland	• deconstruction of old drainage structures • restoration of water bodies • water retention basins	• flood retention • drought prevention • biodiversity enhancement

IT: Lower Po Delta

Climate risks: floods, droughts, saline intrusion, biodiversity loss, water scarcity

Replicating region: Emilia-Romagna region

Improve ground water quality in coastal zone	• planting of salt-resistant, salt filtering plants on coastline • implementation of artificial sand dune on the coast	• prevent salt intrusion • biodiversity enhancement • increase freshwater availability for agriculture • drought prevention
Revitalization of river-environment system in Panaro river	• planting of deep-rooting plants in river bed	• mitigation of soil erosion • flood retention

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RO: Upper Timis river catchment

Climate risks: rivers floods, flash floods, drought, biodiversity loss

Replicating region: Lower Timiş river catchment

Improving water flow regime in Timiş River bed	• increasing the lateral connectivity of the water body • vegetative banks protection • river widening	• reduction of flood risk • creation of habitats/biodiversity • connecting new water areas to the river system • reducing the sediment input
Improving connectivity in river environment system of the Timiş river catchment	• increasing the lateral connectivity of the water body • revitalization of the existing wet zones on the lower river section • vegetative banks protection & forest curtains	• reduction of flood risk • creation of habitats/biodiversity • increase of groundwater level • connecting new water areas to the river system • improvement of microclimate • reducing the sediment and nutrients input

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SK: Ronava River Catchment

Climate risks: rivers floods, flash floods, drought, biodiversity loss, urban heat

Replicating region: Kosice Region

Landscape revitalisation of Roňava water basin in the agricultural areas

- vegetation on agriculture land
- desealing surface
- conversion of arable soil to meadows
- biocorridors for agriculture
- irrigating wetlands
- small reservoirs for rainwater management
- small dams (wood, earth, stone)

- recovery of agroforest
- flood retention
- drought prevention
- increased soil fertility
- increasing of the biological diversity
- strengthening of the landscape thermoregulation

Landscape revitalisation of Roňava water basin in the urban areas

- public greenery
- change of concrete surfaces to permeable
- prepare rainwater drainage to systems enabling infiltration and evaporation
- green roofs, vertical green walls
- small water stages in water courses
- fire protection tanks and small ponds

- recovery of urbanized landscape
- flood retention
- drought prevention
- increased soil fertility
- increasing of the biological diversity
- strengthening of the landscape thermoregulation

WP4 – FRR Ronava river catchment (SK)

- Land4Climate is unique - it includes pilot investments on private land.
- Roňava River Basin was one of the most vulnerable areas to flash floods and heavy rain.
- After open call, we have communicated with eight potential partners. Three sites were selected:
  - A vineyard,
  - A ranch,
  - And a large grassy plot near a built-up area, with a charming historic cottage.

WP4 – FRR Ronava river catchment (SK)

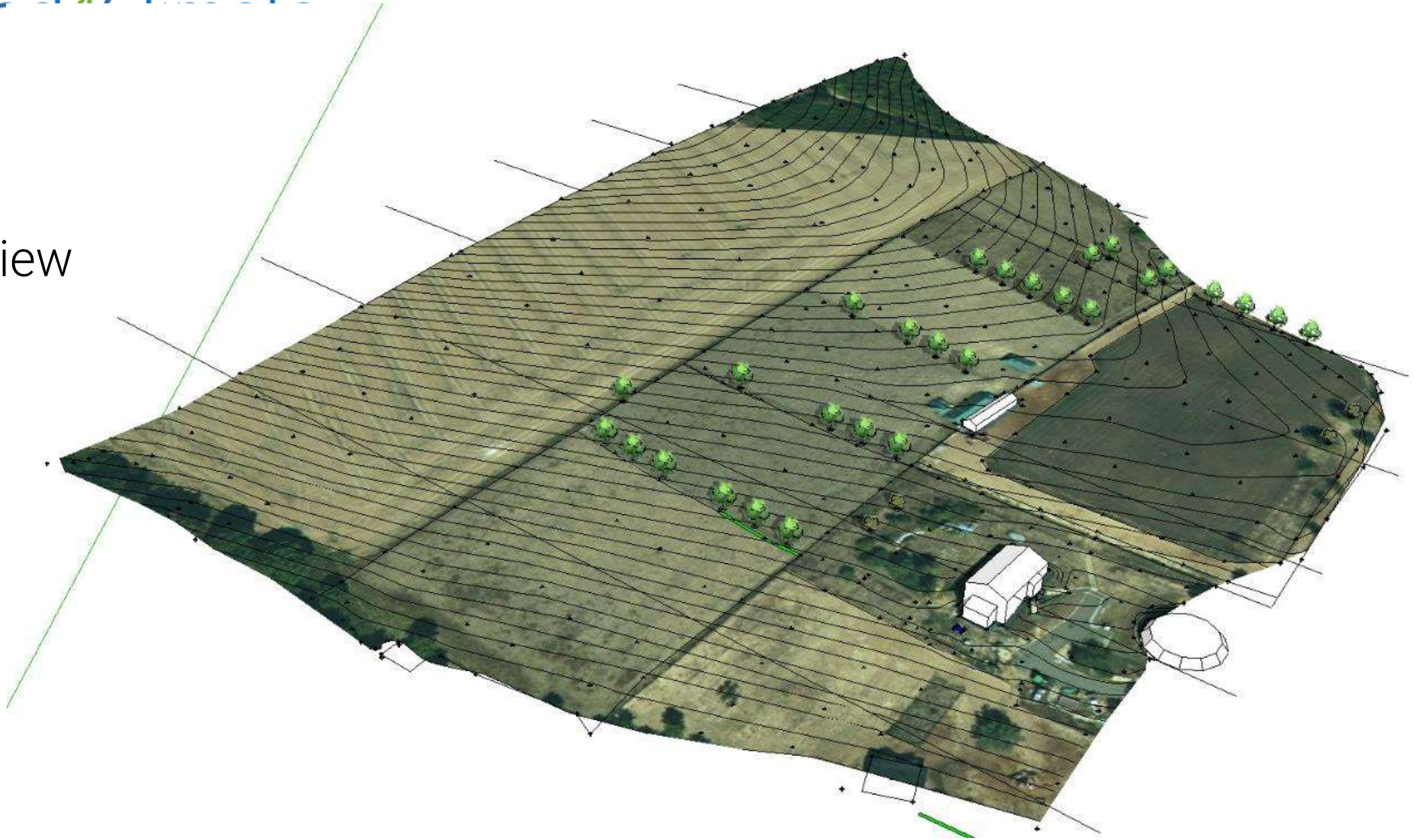
The implementation process:

- Initial consultations,
- Draft designs,
- Preliminary agreements,
- Detailed project documentation with permits,
- Final contracts,
- Public procurement,
- Construction.

Farmyard Byšta

The area is used for horse breeding, grazing, hay production, and agritourism.

Aerial view



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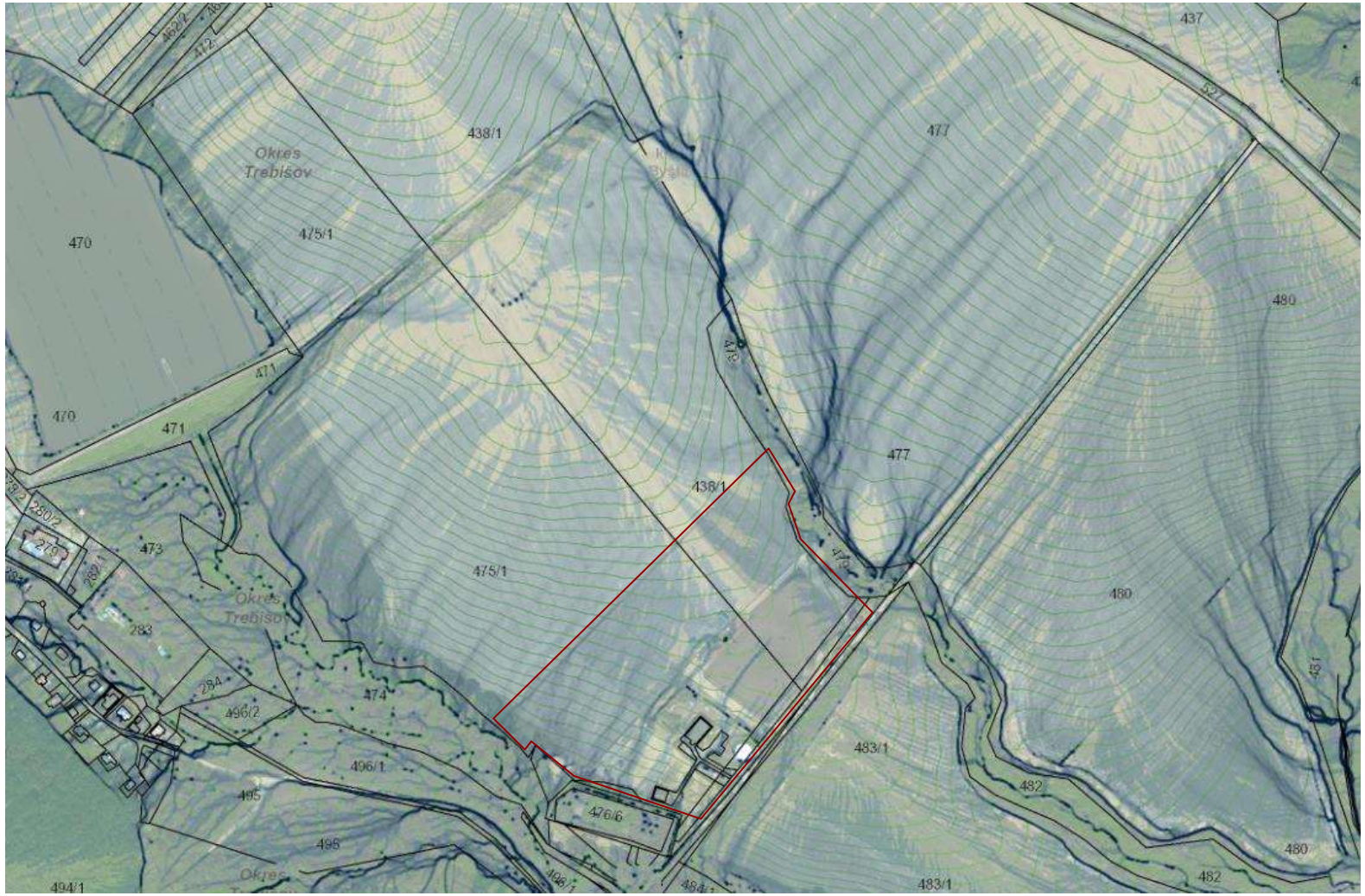
Analysis of water runoff in the landscape, including the wider area, to examine water accumulation within the study area



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Surface runoff

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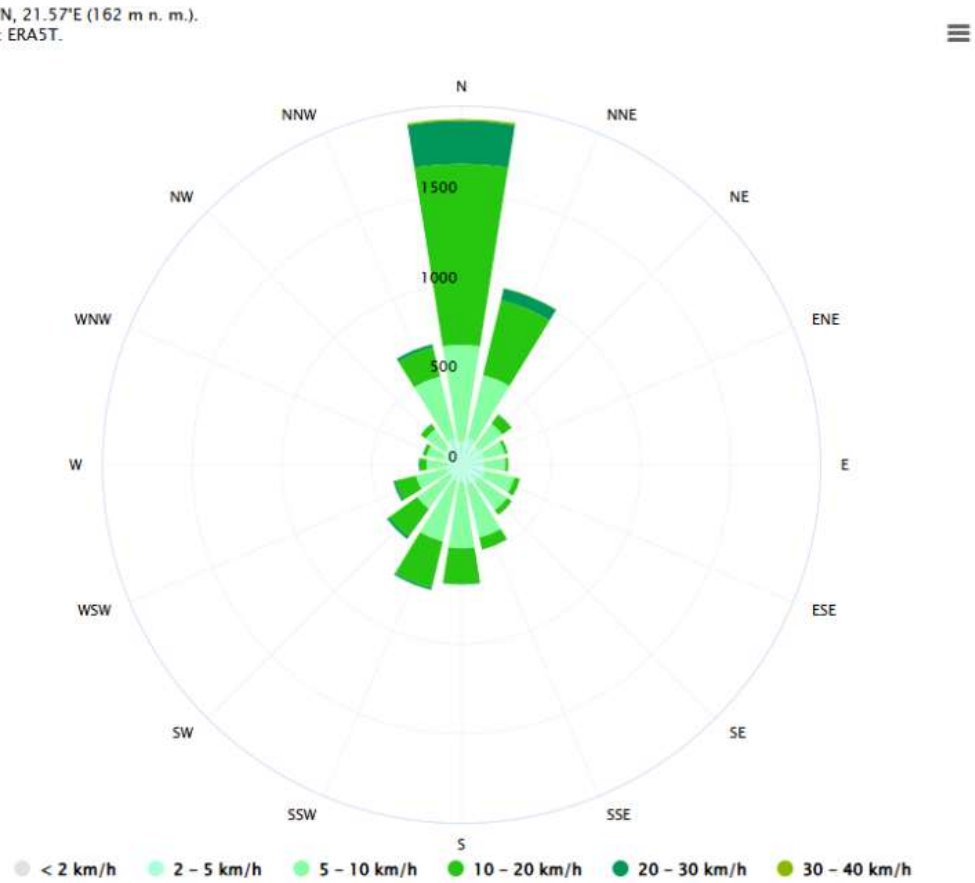
Basic weather conditions:

According to the meteoblue.com model, the wind rose corresponds to the observed situations.

Strong winds have a significant impact on soil erosion.

(source meteoblue.com, spatial plan Trebišov)



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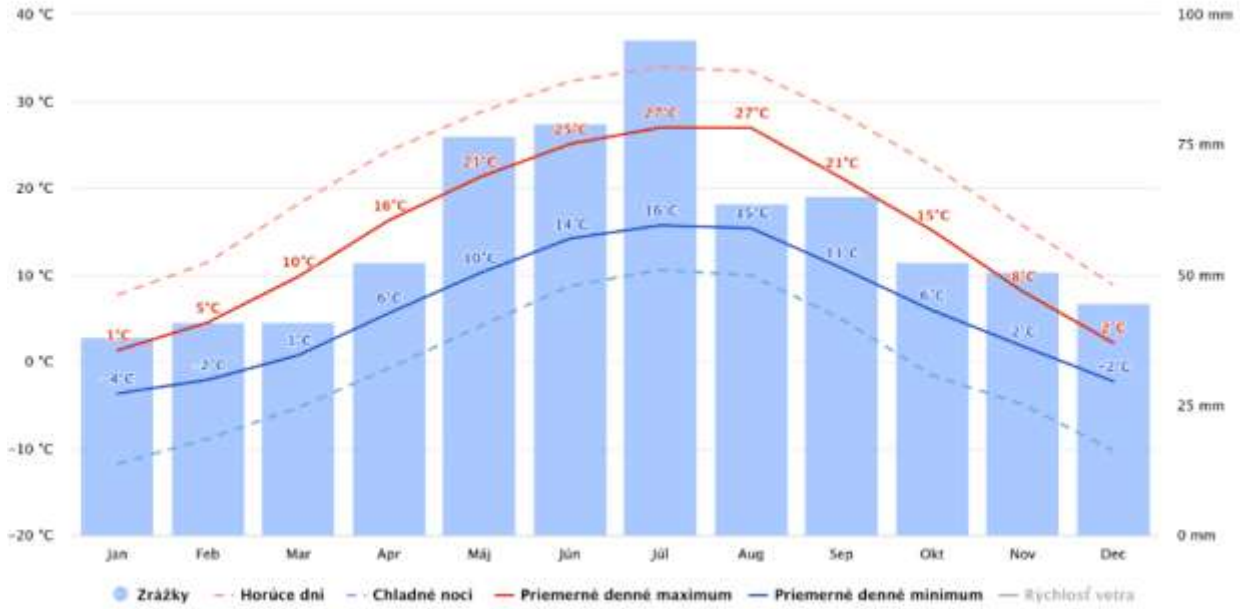
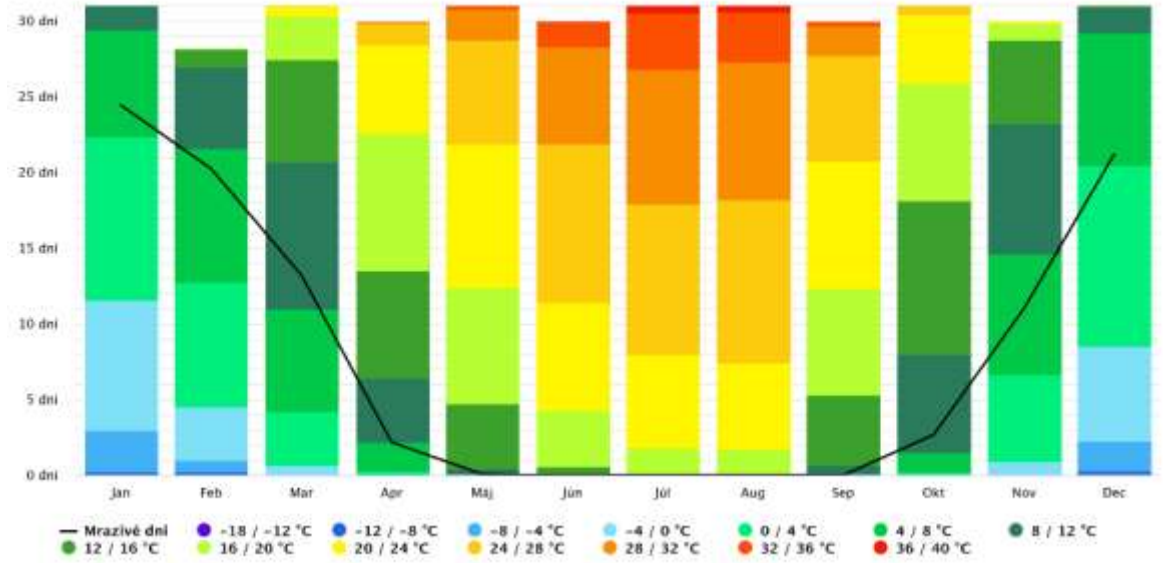
The abundance of sunny and warm days requires shading and water collection for planting and animals.

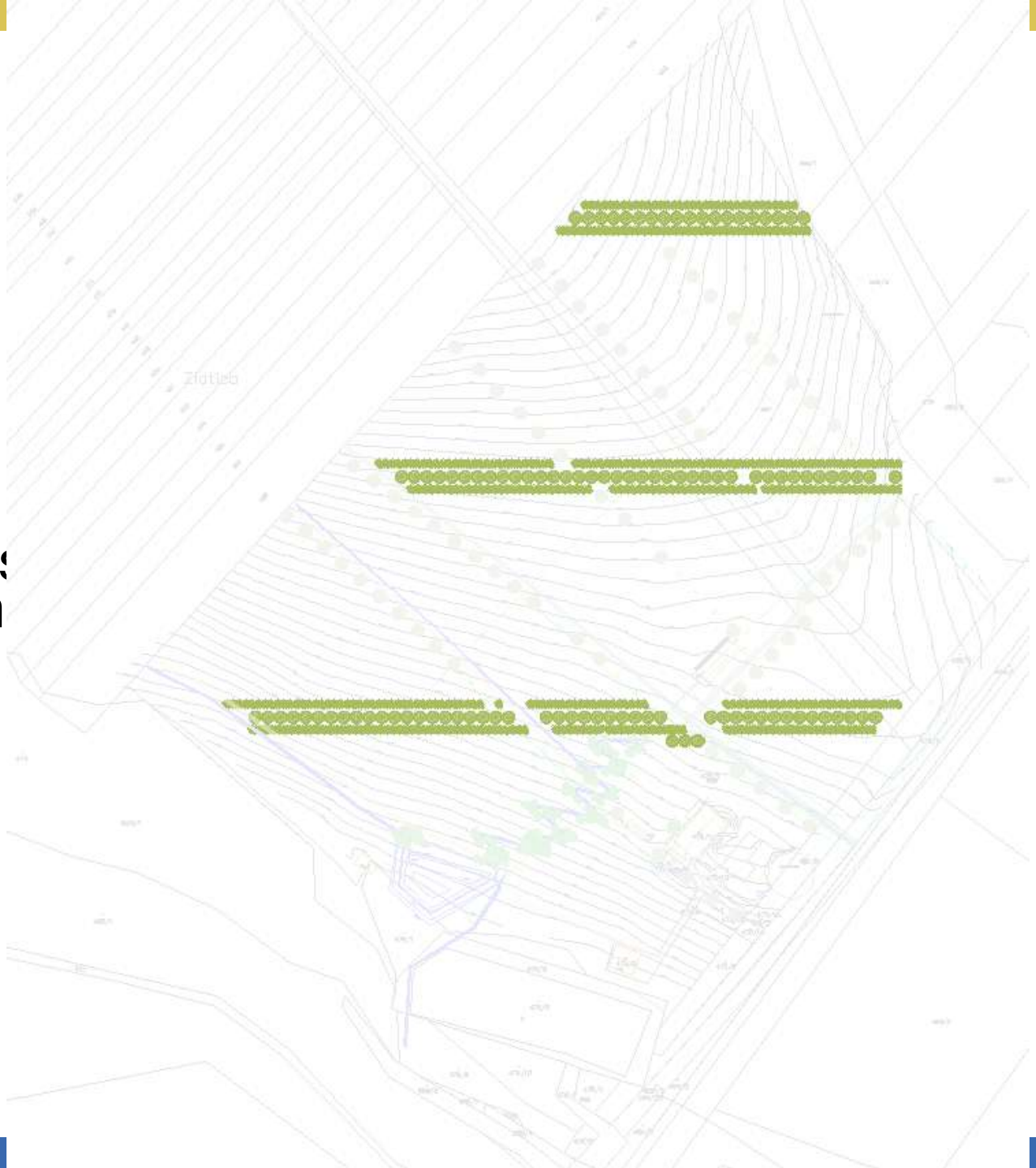
(source meteoblue.com)





Proposed measurements

Windbreaks to mitigate the effects of wind. Windbreaks protect crops people and animals from wind + protecting soil from wind erosion. For animals, windbreaks have been shown to reduce stress levels, reduce the amount of food needed and help prevent the spread of odours.



Proposed measurements

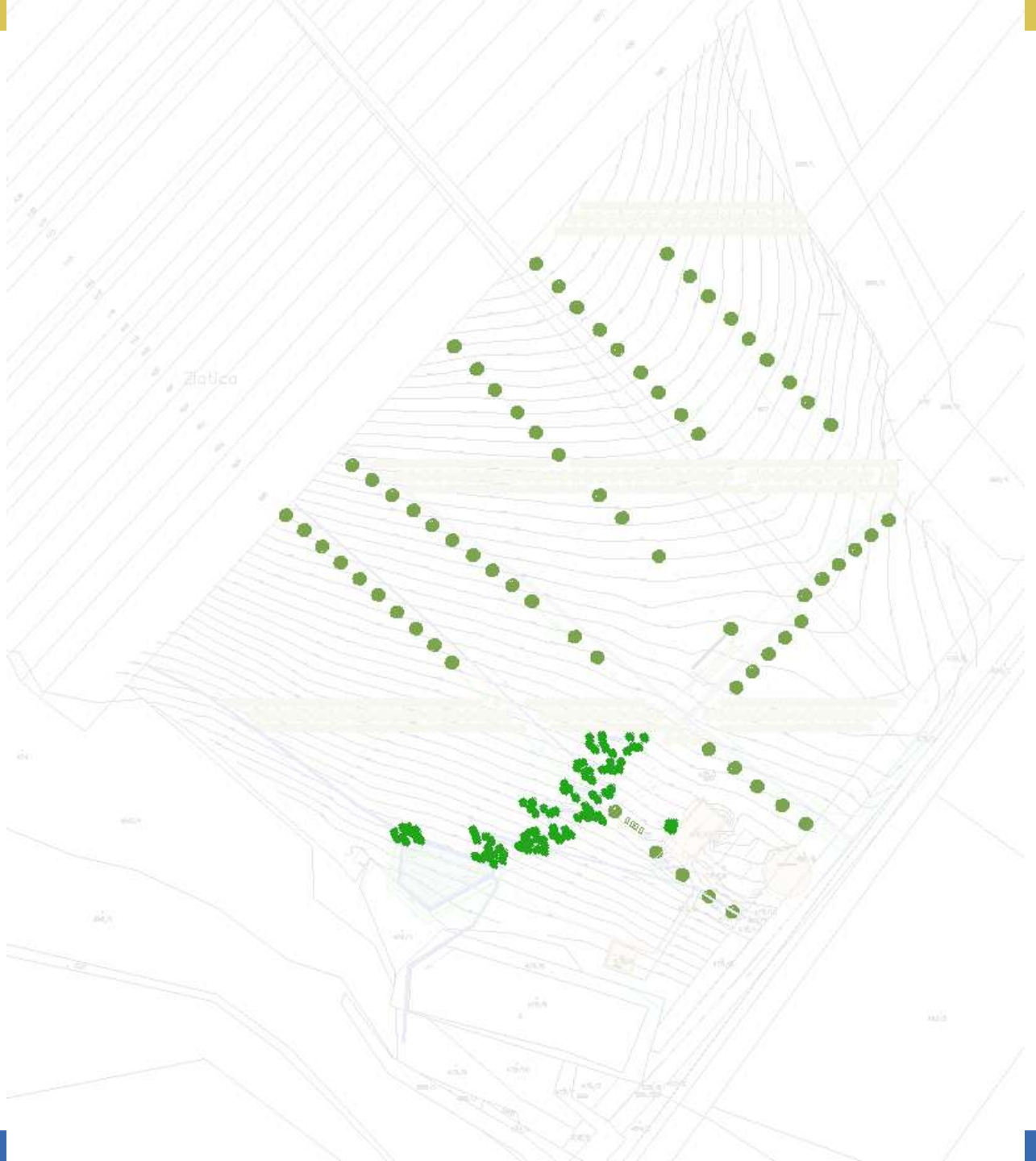
Rainwater retention elements.

Open channels for water discharge to the central reservoir, downpipes connected to underground retention basins.

Contaminated waters undergo sedimentation, filtration and vegetation treatment.

Proposed measurements

Addition of alleys
Alley plantings will serve for shadow, edible tree species increase biodiversity, host pollinators and animals.
Some planting already started.




Addition of alleys
Retention tanks
Windbrakes
Trough for animals
Artificial water flow, water filtration
Sedimentation tank
Biofilter
Water tank
Pumping of the water
Water catchment for animals (40 m3)

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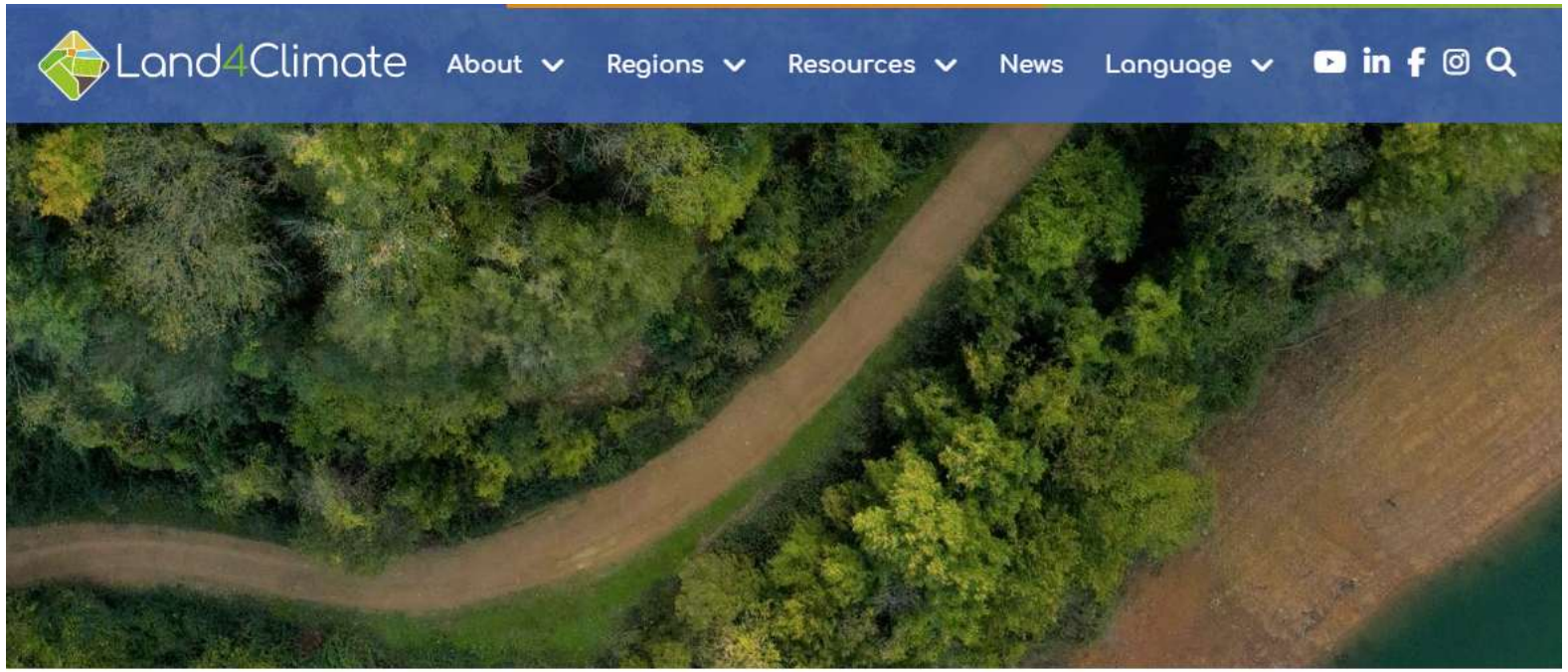
Brezina

- Rain gardens
- Retention tank – collection of rainwater from the roof
- Trench
- Planting of trees
- Windbreaks

Available deliverables (examples)

- Published now via https://www.land4climate.eu/



1.1 Future-oriented local climate adaptation scenarios – frontrunning regions

- This report sets out the methodological approach of the climate risk assessment (CRA) in LAND4CLIMATE including the future-oriented climate adaptation scenarios that are considered. The aim of this deliverable is to explain the methodology of the CRA in a comprehensible manner to ensure its transferability.

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1.3 Climate risk analysis - front-runner regions

Deliverable 1.3 deals with the assessment of the potential impact of climate-related hazards under various possible future pathways of the front-runner regions. It focuses on the Lafnitz catchment area in Austria and the county of Euskirchen in Germany and explores the used data, calculated scenarios and first results of the assessment for the two regions. The aim of the deliverable is to visualise the identified hotspots of climate risks in the two front-runner regions and communicate them to the project partners. Furthermore, the used data and procedures are presented to allow for transparency and traceability.

1.5 Visualisation of cause-effect relations and potential systemic effects – frontrunning regions

- This report presents the cause-effect relations of climate hazards such as Drought, Heat, Flooding and Heavy Rain through climate impact chains (CIC). Additionally, nature-based solutions (NbS) are addressed, and examples of NbS interventions that can be implemented within the framework of the Land4Climate project are introduced. The objective of the report is to offer an overview of the cause-effect relations of climate hazards on multiple sectors and to illustrate the systemic effects of nature-based solutions on mitigating the impacts of climate hazards.
- After a brief introduction, the report outlines the concept of CIC and presents the individual CIC for the climate hazards Drought, Heat, Flooding, Heavy Rain and Storm Surge highlighting their influence on various sectors. This is followed by a brief introduction to the concept of NbS, including a description of the characteristics that they should exhibit within the project context. Subsequently, various NbS measures are introduced, which can be implemented on private land within the five sectors: built environment, agriculture, forest, coast, and rivers. Concluding the deliverable is a summary of key findings and insights.

1.5 – example of climate impact chains

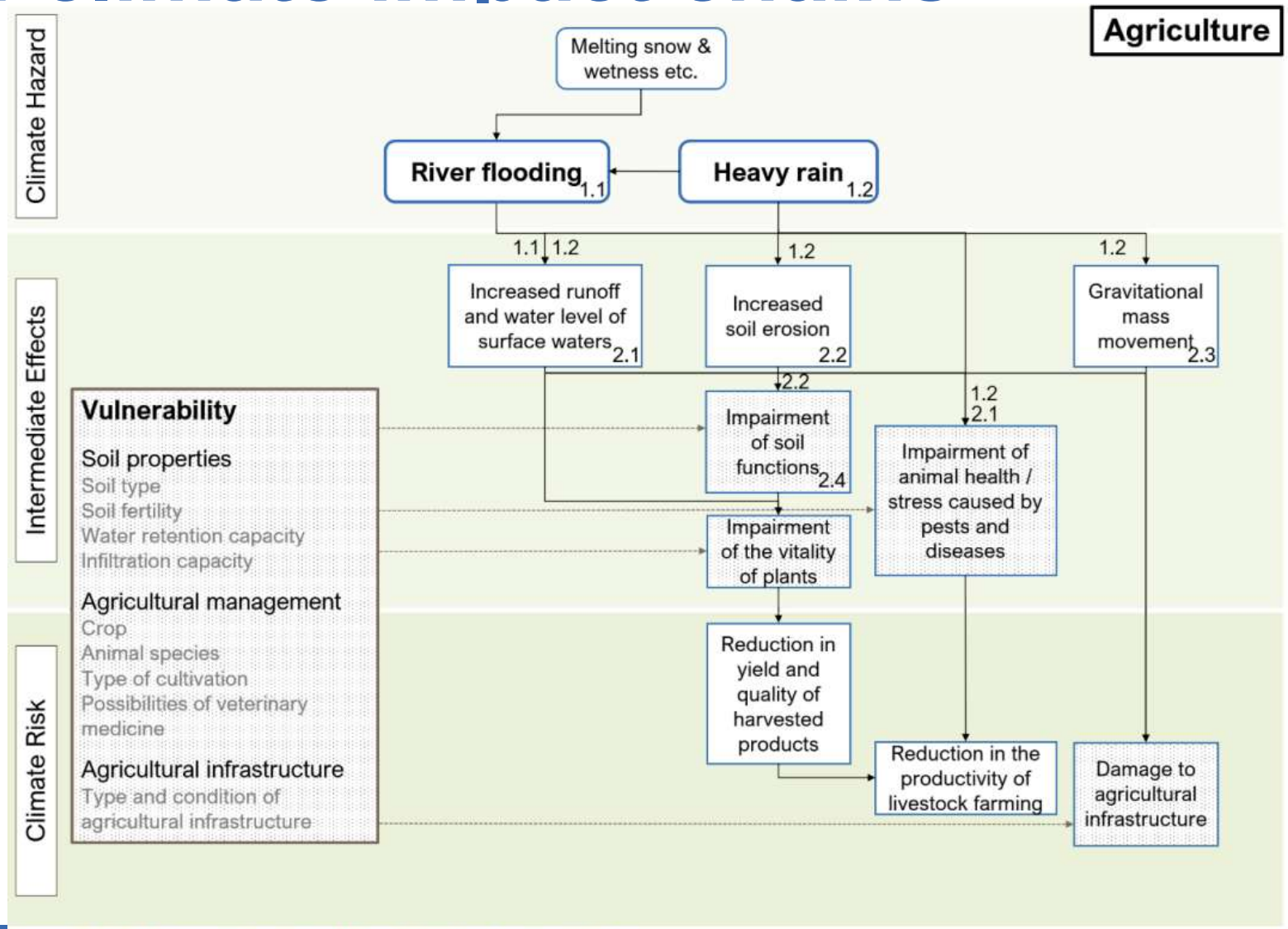

Figure 9: CIC for Heavy Rain and River Flooding on agriculture

2.1 Report on the modelling and monitoring methodology and NBS performance indicators

- Deliverable outlines the methodologies for modeling and monitoring the effectiveness and efficiency of Nature-Based Solutions (NBS) in mitigating Hydro-Meteorological Hazards (HMHs). It focuses on describing the approach that will be used for evaluating the performance indicators through integrated assessment frameworks applied in various frontrunning regions. The report emphasizes the importance of context-specific assessments and recommends adopting adaptable methodologies to optimize NBS implementation across different environments. Additionally, the deliverable lists and describes the main NBSs that are going to be implemented in each frontrunning region.

WP4 - NBS implementation

- NBS will be implemented and tested (WP4) in order to learn lessons that can be derived from the front-running regions into more generic hands-on knowledge to catalyse mainstreaming and upscaling in replicating regions

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LAND4CLIMATE partners

technische universität dortmund

Lehrstuhl und Institut für Wasserbau und Wasserwirtschaft IWW | RWTH AACHEN UNIVERSITY

DEN | DESIGN ENTREPRENEURSHIP INSTITUTE

NACHHALTIGKEIT KREIS EUSKIRCHEN

Agency for the Support of Regional Development Košice

BOKU Institute of Landscape Planning

ALMA MATER STUDIORUM UNIVERSITÀ DI BOLOGNA

ICLEI Local Governments for Sustainability EUROPE

Das Land Steiermark → Wasserwirtschaft

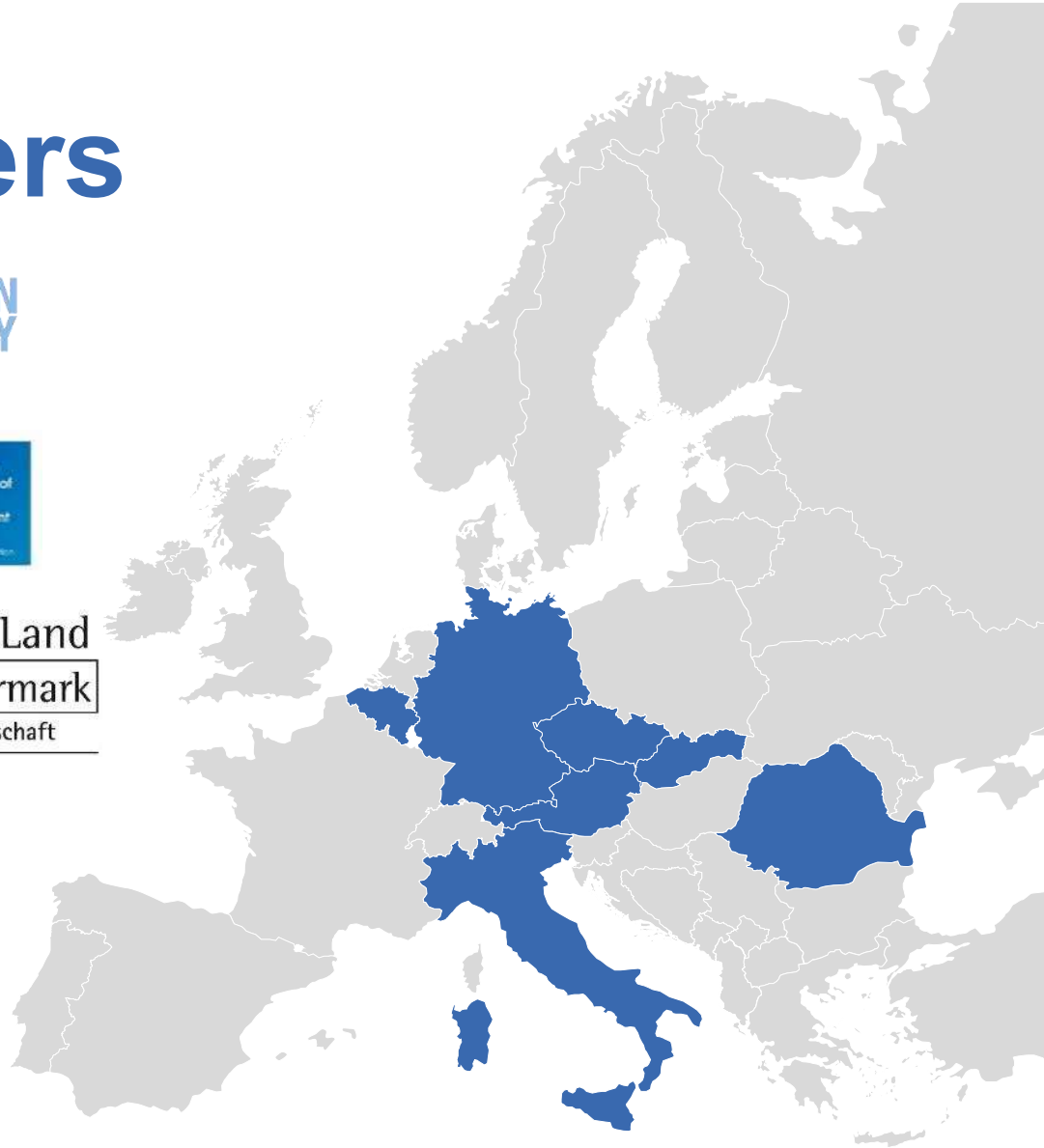
Land Burgenland

Universitatea Politehnica Timișoara

KrásnáLípa CENTRUM ČESKÉHO ŠVÝCARSKA

NÁRODNÍ PARK ČESKÉ ŠVÝCARSKO

Parco Delta del Po Emilia-Romagna



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Funded by the European Union

LAND4CLIMATE has received funding from the European Union's Horizon Europe Programme for research and innovation under project number 101112781.